

Department of Energy

§ 431.12

State regulation means a law or regulation of a State or political subdivision thereof.

[69 FR 61923, Oct. 21, 2004, as amended at 71 FR 71369, Dec. 8, 2006; 74 FR 12071, Mar. 23, 2009]

Subpart B—Electric Motors

SOURCE: 69 FR 61923, Oct. 21, 2004, unless otherwise noted.

§ 431.11 Purpose and scope.

This subpart contains energy conservation requirements for electric motors. It contains test procedures that EPCA requires DOE to prescribe, related requirements, energy conservation standards prescribed by EPCA, labeling rules, and compliance procedures. It also identifies materials incorporated by reference in this part.

§ 431.12 Definitions.

The following definitions apply for purposes of this subpart, and of subparts K through M of this part. Any words or terms not defined in this Section or elsewhere in this Part shall be defined as provided in Section 340 of the Act.

Accreditation means recognition by an accreditation body that a laboratory is competent to test the efficiency of electric motors according to the scope and procedures given in Test Method B of Institute of Electrical and Electronics Engineers (IEEE) Standard 112–1996, *Test Procedure for Polyphase Induction Motors and Generators*, and Test Method (1) of CSA Standard C390–93, *Energy Efficient Test Methods for Three-Phase Induction Motors*. (Incorporated by reference, see § 431.15)

Accreditation body means an organization or entity that conducts and administers an accreditation system and grants accreditation.

Accreditation system means a set of requirements to be fulfilled by a testing laboratory, as well as rules of procedure and management, that are used to accredit laboratories.

Accredited laboratory means a testing laboratory to which accreditation has been granted.

Alternative efficiency determination method or *AEDM* means, with respect

to an electric motor, a method of calculating the total power loss and average full load efficiency.

Average full load efficiency means the arithmetic mean of the full load efficiencies of a population of electric motors of duplicate design, where the full load efficiency of each motor in the population is the ratio (expressed as a percentage) of the motor's useful power output to its total power input when the motor is operated at its full rated load, rated voltage, and rated frequency.

Basic model means, with respect to an electric motor, all units of a given type of electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics which affect energy consumption or efficiency. For the purpose of this definition, "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which § 431.25 prescribes nominal full load efficiency standards.

Certificate of conformity means a document that is issued by a certification program, and that gives written assurance that an electric motor complies with the energy efficiency standard applicable to that motor, as specified in § 431.25.

Certification program means a certification system that determines conformity by electric motors with the energy efficiency standards prescribed by and pursuant to the Act.

Certification system means a system, that has its own rules of procedure and management, for giving written assurance that a product, process, or service conforms to a specific standard or other specified requirements, and that is operated by an entity independent of both the party seeking the written assurance and the party providing the product, process or service.

CSA means CSA International.

Definite purpose motor means any motor designed in standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions

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other than usual, such as those specified in National Electrical Manufacturers Association (NEMA) Standards Publication MG1–1993 (MG1), *Motors and Generators*, paragraph 14.03, “Unusual Service Conditions,” (Incorporated by reference, see § 431.15) or for use on a particular type of application, and which cannot be used in most general purpose applications.

Enclosed motor means an electric motor so constructed as to prevent the free exchange of air between the inside and outside of the case but not sufficiently enclosed to be termed airtight.

Fire pump motors [Reserved]

General purpose motor means any motor which is designed in standard ratings with either:

(1) Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified NEMA Standards Publication MG1–1993, paragraph 14.02, “Usual Service Conditions,” (Incorporated by reference, see § 431.15) and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.03, “Unusual Service Conditions,” (Incorporated by reference, see § 431.15) or for a particular type of application, and which can be used in most general purpose applications.

General purpose electric motor (subtype I) means any motor which is designed in standard ratings with either:

(1) Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.02, “Usual Service Conditions,” (incorporated by reference; see § 431.15) and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.03, “Unusual Service

Conditions,” (incorporated by reference; see § 431.15) or for a particular type of application, and which can be used in most general purpose applications.

General purpose electric motor (subtype II) means any motor incorporating the design elements of a general purpose electric motor (subtype I) that are configured as one of the following:

- (i) A U-frame motor;
- (ii) A design C motor;
- (iii) A close-coupled pump motor;
- (iv) A footless motor;
- (v) A vertical solid shaft normal thrust motor (as tested in a horizontal configuration);
- (vi) An 8-pole motor (900 rpm); or
- (vii) A poly-phase motor with voltage of not more than 600 volts (other than 230 or 460 volts).

IEC means the International Electrotechnical Commission.

IEEE means the Institute of Electrical and Electronics Engineers, Inc.

NEMA means the National Electrical Manufacturers Association.

Nominal full load efficiency means, with respect to an electric motor, a representative value of efficiency selected from Column A of Table 12–8, NEMA Standards Publication MG1–1993, (Incorporated by reference, see § 431.15), that is not greater than the average full load efficiency of a population of motors of the same design.

NEMA design B general purpose electric motor [Reserved]

Open motor means an electric motor having ventilating openings which permit passage of external cooling air over and around the windings of the machine.

Special purpose motor means any motor, other than a general purpose motor or definite purpose motor, which has special operating characteristics or special mechanical construction, or both, designed for a particular application.

Total power loss means that portion of the energy used by an electric motor not converted to rotational mechanical power, expressed in percent.

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§ 431.15

TEST PROCEDURES, MATERIALS INCORPORATED AND METHODS OF DETERMINING EFFICIENCY

§ 431.15 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following test procedures into Subpart B of Part 431. The material listed in paragraph (b) of this section has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE test procedures unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *List of standards incorporated by reference.* (1) The following provisions of National Electrical Manufacturers Association Standards Publication MG1-1993, *Motors and Generators*, with Revisions 1, 2, 3 and 4, IBR approved for §§ 431.12; 431.31 and appendix B to subpart B of Part 431:

(i) Section I, *General Standards Applying to All Machines*, Part 1, *Referenced Standards and Definitions*, paragraphs 1.16.1, 1.16.1.1, 1.17.1.1, 1.17.1.2, and 1.40.1, IBR approved for § 431.12;

(ii) Section I, *General Standards Applying to All Machines*, Part 4, *Dimensions, Tolerances, and Mounting*, paragraph 4.01 and Figures 4-1, 4-2, 4-3, and 4-4, IBR approved for § 431.12;

(iii) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 11, *Dimensions—AC and DC Small and Medium Machines*, paragraphs 11.01.2, 11.31 (except the lines for frames 447T, 447TS, 449T and 449TS), 11.32, 11.34 (except the line for frames 447TC and 449TC, and the line for frames 447TSC and 449TSC), 11.35, and 11.36 (except the line for frames 447TD and 449TD, and the line for frames 447TSD and 449TSD), and Table 11-1, IBR approved for § 431.12;

(iv) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 12, *Tests and Performance—AC and DC Motors*, paragraphs 12.35.1, 12.35.5, 12.38.1, 12.39.1, and 12.40.1, 12.58.1, and Tables 12-2 and 12-8, IBR approved for § 431.12; and

(v) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 14, *Application Data—AC and DC Small and Medium Machines*, paragraphs 14.02 and 14.03, IBR approved for § 431.12.

(2) Institute of Electrical and Electronics Engineers, Inc., Standard 112-1996, *Test Procedure for Polyphase Induction Motors and Generators*, Test Method B, *Input-Output with Loss Segregation*, and the correction to the calculation at item (28) in Section 10.2 Form B-Test Method B issued by IEEE on January 20, 1998. (Note: Paragraph 2 of appendix A to subpart B of Part 431 sets forth modifications to this Standard when it is used for purposes of Part 431 and EPCA, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of Part 431.

(3) CSA International Standard C390-93, *Energy Efficiency Test Methods for Three-Phase Induction Motors*, Test Method (1), *Input-Output Method With Indirect Measurement of the Stray-Load Loss and Direct Measurement of the Stator Winding (I²R), Rotor Winding (I²R), Core and Windage-Friction Losses*, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of Part 431.

(4) International Electrotechnical Commission Standard 60034-1 (1996), *Rotating electrical machines, Part 1: Rating and performance*, with Amendment 1 (1997), Section 3: *Duty*, clause 3.2.1 and figure 1, IBR approved for § 431.12.

(5) International Electrotechnical Commission Standard 60050-411 (1996), *International Electrotechnical Vocabulary Chapter 411: Rotating machines*, sections 411-33-07 and 411-37-26, IBR approved for § 431.12.

(6) International Electrotechnical Commission Standard 60072-1 (1991), *Dimensions and Output Series for Rotating Electrical Machines—Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*, clauses 2, 3, 4.1, 6.1, 7, and 10, and Tables 1, 2 and 4, IBR approved for § 431.12.

(7) International Electrotechnical Commission Standard 60034-12 (1980), *Rotating Electrical Machines, Part 12: Starting performance of single-speed three-phase cage induction motors for voltages up to and including 660 V*, with Amendment 1 (1992) and Amendment 2 (1995), clauses 1, 2, 3.1, 4, 5, and 6, and